PS 155

INTERFACE TO SIMPLEX (‘PUSH TO TALK’)

WIRELESS INTERCOM

USER MANUAL

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This product is designed and manufactured by::
ASL Intercom BV
Zonnebaan 42
3542 EG Utrecht
The Netherlands
Phone: +31 (0)30 2411901
Fax: +31 (0)30 2667373
E-mail: info@asl-inter.com
Web: www.asl-inter.com

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1.0 GENERAL DESCRIPTION

The PS 155 is designed to be a single channel audio interface between simplex ('push to talk') wireless intercom systems and ASL wired (party line) intercom systems.
The unit is housed in a strong steel tabletop case.

Located on the front panel are volume controls (send and receive), side tone adjustment trimmers, a test tone switch, VOX adjustment trimmers and TX controls.

The PS 155 contains an audio interface which splits the audio on the wired intercom party line into an audio output and an audio input. Via the audio output the audio of the party line is sent to the wireless intercom system. Via the audio input the audio of the wireless system is sent to the party line. Audio output and audio input can be separately volume controlled by a SEND respectively a RECEIVE volume knob. Both the output and the input are transformer balanced.

The built-in test tone generator assists obtaining the best possible side tone rejection in the audio interface section. The tone generator is activated by pushing the recessed switch at the front panel.

To connect the PS 155 to a wireless intercom system, a special cable is needed. In this user manual it is assumed that the cable is connected to a simplex ('push to talk') wireless intercom station (Motorola, Kenwood or other make), hereinafter called **"the wireless unit".**

If the internal Transmit Switch of the PS 155 is triggered, the wireless unit goes from '**receive mode'** to **'transmit mode'**.

There are 3 ways to trigger the Transmit Switch, to be selected by a 3-position switch in the TX CONTROL section of the PS 155 front panel. See sections 3.0 and 5.0.

2.0 INSTALLATION

This PS 155 is powered (30V DC) by an ASL master station or separate power supply, via the intercom connection cable (the party line). Connect this cable to the LINE connector on the rear panel. Use professional microphone cable with 2 wires and 1 shield only.

The PS 155 is fully protected against wiring mistakes (reverse power) or short-circuit in the intercom connecting cable.
To connect the PS 155 to the wireless unit a special cable is needed, to be connected to the Sub-D9 connector on the rear panel.

3.0 FRONT PANEL CONTROLS

1 RECEIVE volume knob
This knob is for adjusting the level of the audio that is received from the wireless unit

2 SEND volume knob
This knob is for adjusting the level of the audio that is sent to the wireless unit

3 SIDE TONE LOW trimmer
4 SIDE TONE HIGH trimmer
5 SIDE TONE LEVEL trimmer
Trimmers 3, 4 and 5 are for adjusting the rejection of the side tone; the LEVEL trimmer for the whole audio spectrum, the HIGH trimmer for fine tuning the high frequencies and the LOW trimmer for

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fine tuning the low frequencies. See section 7.0

6 TEST TONE button
By pushing this recessed button the built-in test tone generator is activated. The test tone assists in obtaining the best possible side tone rejection. See section 7.0

7 VOX LEVEL trimmer
This trimmer adjusts the detection level of the VOX switch. As soon as the VOX circuitry detects an audio signal on the intercom party line that is louder than the level set by this trimmer, the wireless unit goes from receive mode to transmit mode. See section 8.0 for the VOX adjustment procedure.

8 VOX RELEASE trimmer
After the audio signal of the intercom party line falls below the set VOX level, the wireless unit stays in transmit mode for a period of time that is preset by this trimmer. See section 8.0 for the VOX adjustment procedure.

9 TX CONTROL select switch
This switch has the positions VOX, CALL and PTT, each indicating the way the wireless unit is triggered to go from receive mode to transmit mode. See section 5.0

10 POWER LED
This LED is lit when the PS 155 is powered by the intercom line.

11 Rx/Tx LED
This LED is lit green when the wireless unit is in receive mode and lit red when the wireless unit is in transmit mode. See also section 5.0.

4.0 REAR PANEL CONNECTORS

12 LINE connectors
These male and female XLR-3 connectors are for connecting the PS 155 to the intercom party line.

Pin assignments:
Pin 1: 0 V / ground shield
Pin 2: +30 V power wire
Pin 3: audio wire

13 TO TRANSCEIVER connector
This Sub-D 9 pole connector is for connecting the PS 155 to the wireless unit. The connector is also used to connect an external PTT switch to the PS 155.

For pin assignment and further details, see section 6.0.

5.0 RECEIVE AND TRANSMIT MODE

If the internal Transmit Switch of the PS 155 is triggered, the wireless unit connected to the PS 155 (see section 8.0) goes from 'receive mode' to 'transmit mode'. The Rx/Tx LED (#11) goes from being lit green to being lit red. The Transmit Switch can be triggered in three different ways, to be selected by a 3-position switch in the TX CONTROL section of the PS 155 front panel. These switch positions are:

'CALL'
Transmit mode is enabled by pushing any CALL button at the wired intercom stations. Detect of this Call signal triggers the Transmit Switch. When this option is selected, the buzzers of all user stations connected to the party line are automatically disabled. The Call Detect level can be adjusted by trimmer R29, see section 9.0.

'**VOX'**
Transmit mode is enabled by detecting audio on the intercom party line. As soon as this audio signal exceeds an adjustable threshold, the Transmit Switch is triggered. The VOX has a special frequency contouring circuit which is optimized for the human voice.
The attack (threshold) level and the release time can be adjusted at the front panel.
The attack time can be adjusted by trimmer R9, see section 9.0.

'PTT' (Push To Talk)
Transmit mode is enabled by pushing an external button, to be connected to the PS 155.
This push button should be momentary only.
See also section 6.0

6.0 THE CABLE TO THE WIRELESS UNIT

This section describes the connection between the PS 155 and the wireless unit and the connection between the PS 155 and an external PTT switch.

At the wireless unit the connection cable is plugged into the connector which is normally used to connect a speaker/microphone device. At the PS 155 the cable is plugged into Sub-D9 connector at the rear panel.

Pin assignment of the Sub-D9 connector:
Pin 1: Audio input -
Pin 2: Audio input +
Pin 3: PTT button switch
Pin 4: Transmit switch (Common)
Pin 5: Transmit switch (Normally Open)
Pin 6: Transmit switch (Normally Closed)
Pin 7: Ground/shield
Pin 8: Audio output +
Pin 9: Audio output -

Pin 1 and 2 :
The Audio Input is transformer balanced, decoupled with capacitors to obtain a high DC resistance. If the wireless unit uses asymmetric signal transport then the audio input - (pin 1) is to be connected to the ground of the wireless unit and (if necessary) to pin 7 of the Sub-D 9 connector.

Pin 8 and 9 :
The Audio Output is transformer balanced, decoupled with capacitors to obtain a high DC resistance. If the wireless unit uses asymmetric signal transport then the output - (pin 9) is to be connected to the ground of the wireless unit and (if necessary) to pin 7 of the Sub-D9 connector. The gain of the Audio Output can be adjusted by trimmer R4, see section 9.0.

Pin 3 and 7 :
An external PTT (Push To Talk) button may be connected to these pins of the Sub-D9 connector. By pushing the PTT button the wireless unit is triggered to go from receive mode to transmit mode. De PTT button only works if the TX CONTROL switch (#9) is set in position "PTT:"

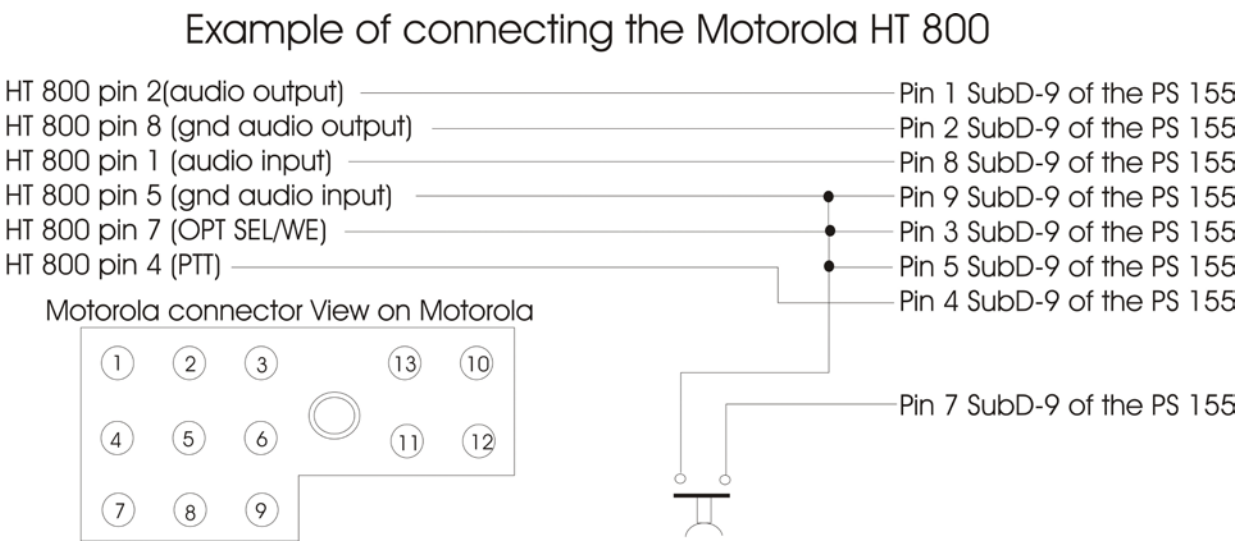
Pins 4, 5 and 6 :
The Transmit Switch contacts are located between these pins of the sub-D9 connector.

Normally Open:
Most wireless units need a contact to be closed to go from receive mode to transmit mode. Use pin 4 and 5. Some wireless units need to see a special DC resistance. Ask the manufacturer of the wireless intercom system to advise you on what value of the resistor to use. Usually the resistor is to be mounted in the Common wire of the Transmit Switch contacts. See also drawings below.

Normally Closed:
Some wireless units need a contact to be opened to go from receive to transmit mode. Use pin 4 and 6.

Important notes:

- Use high quality cables and connectors
- Make sure that all interconnecting cables are properly shielded. This to avoid RF interference of the wireless intercom system and the wired ASL intercom system
- If possible, use a balanced audio connection to and from the wireless unit. Using a cable assembly from the wireless intercom manufacturer is to be preferred.
- Make sure that the connections made to the wireless unit are according to the specifications of its manufacturer
- Always use the by ASL supplied Sub-D9 connector cable part; this connector is shielded
- To avoid RF interference, place the wireless unit not to close to the PS 155 and the intercom cables. But the connection cable should not be too long.


Example of connecting the Motorola HT 800
HT 800 pin 2(audio output)
HT 800 pin 8 (gnd audio output)
HT 800 pin 1 (audio input)
HT 800 pin 5 (gnd audio input)
HT 800 pin 7 (OPT SEL/WE)
HT 800 pin 4 (PTT)
Motorola connector View on Motorola
1 2 3 13 10
4 5 6 11 12
7 8 9
Pin 1 SubD-9 of the PS 155
Pin 2 SubD-9 of the PS 155
Pin 8 SubD-9 of the PS 155
Pin 9 SubD-9 of the PS 155
Pin 3 SubD-9 of the PS 155
Pin 5 SubD-9 of the PS 155
Pin 4 SubD-9 of the PS 155
Pin 7 SubD-9 of the PS 155

7.0 SIDE TONE ADJUSTMENT PROCEDURE (PARTY LINE)

To adjust the side tone, proceed as follows:

- Connect the PS 155 to the wireless unit
- If the wireless unit has a volume control turn it down to approx. 10%;
  a volume that is too high may cause problems such as distortion
- Connect the PS 155 to the party line of the wired ASL intercom system
- Put the SEND and RECEIVE volumes of the PS 155 in the 12 o'clock position
- Push the 'Test Tone' button with a pen or pencil
- Listen to one of the wireless units (not the one which has the connection cable)
- Adjust the 3 side tone trimmers so that at the wireless unit the test tone listen level is set to a minimum. First the LEVEL trimmer and then the HIGH and the LOW trimmer.
- If needed, the SEND volume of the PS 155 can be turned up while adjusting the trimmers
- Repeat the adjustment of the trimmers over and over until you are sure that you have obtained the minimum listen level

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8.0 VOX ADJUSTMENT PROCEDURE

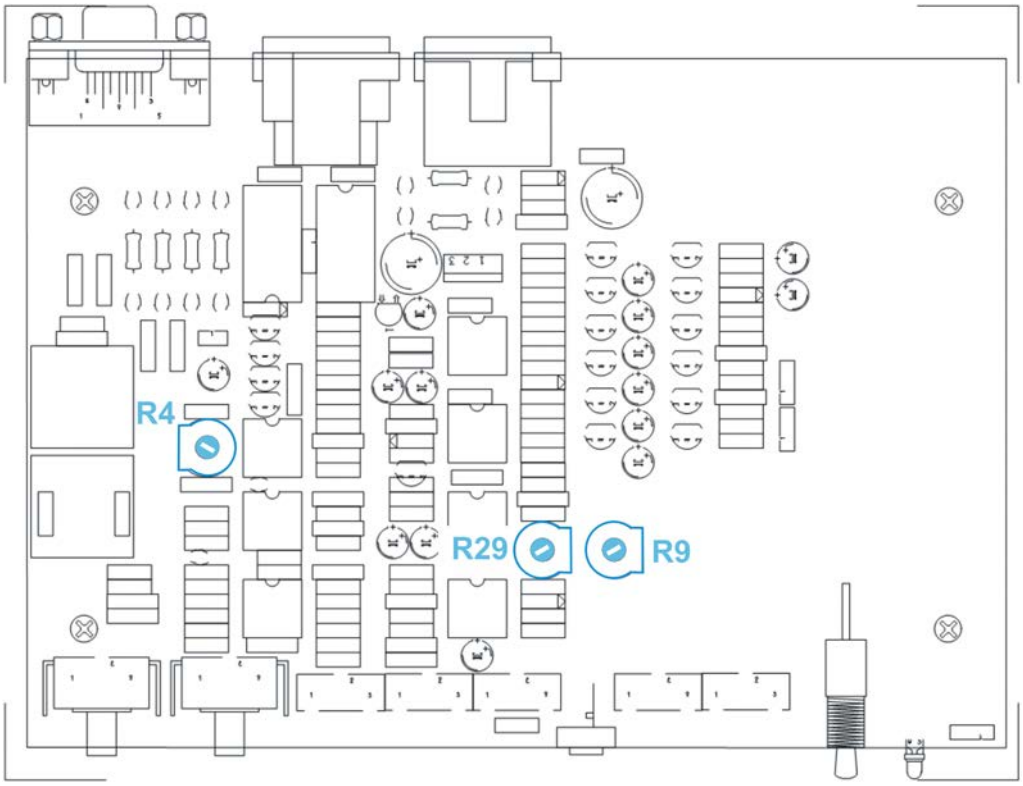
Before starting this procedure make sure that the party line side tone has been properly adjusted (see section 7.0) !

To adjust the VOX, proceed as follows:

- Put the TX CONTROL select switch to "VOX"
- Turn the LEVEL and RELEASE trimmers counter clockwise
- Connect an intercom user station to the party line, connect a headset to that station and speak into the microphone of headset
- With the LEVEL trimmer adjust the audio level on the party line to which the PS 155 should trigger the wireless unit to go from receive mode to send mode (the Rx/Tx LED changes from green to red)
- With the RELEASE trimmer adjust the release time of the VOX switch

The attack time of the VOX switch can be adjusted by internal trimmer R9, see section 9.0.

9.0 INTERNAL CONTROLS



To access the internal trimmers the PS 155 needs to be opened. Before doing so, disconnect the unit of all other equipment. Open the PS 155 by removing the two screws of the cover at either side. Then connect the PS 155 to the intercom party line and to the wireless unit.

OUTPUT GAIN trimmer (R4)
With this trimmer the output gain can be adjusted. The trimmer is located on the PCB board at the left, near to the transformers.
To increase the gain, turn clockwise.
To decrease the gain, turn counter clockwise.

VOX DETECT trimmer (R9)
With this trimmer the attack time of the VOX switch can be adjusted. Proceed as follows:

- Set the TX CONTROL select switch to position "VOX"
- Connect a user station to the intercom party line and connect a headset to that station
- Speak into the headset microphone
- First adjust the LEVEL and RELEASE trimmers at the front panel
- Then adjust the attack time with trimmer R9

CALL DETECT trimmer (R29)
With this trimmer the CALL detect level can be adjusted. Proceed as follows:

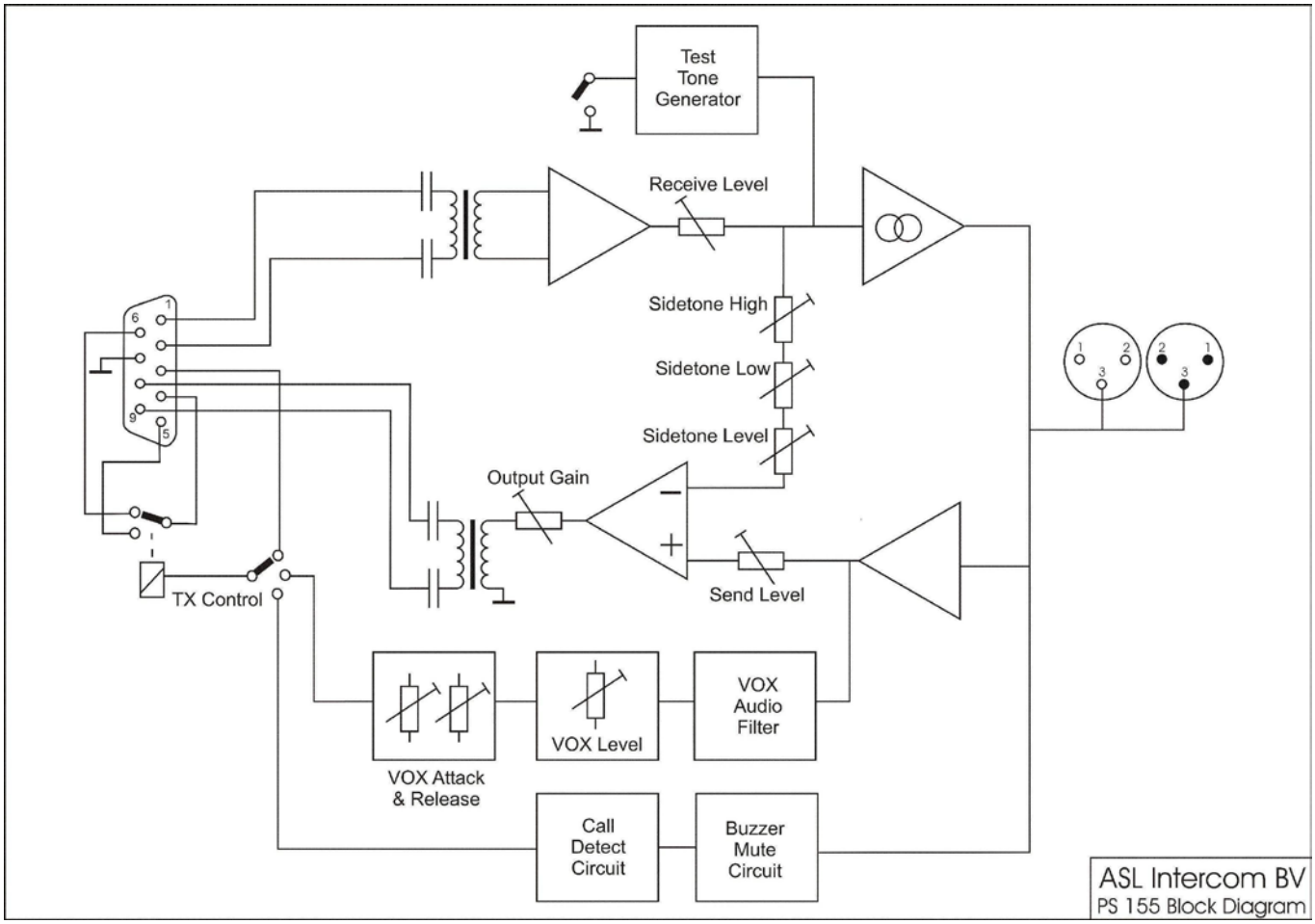
- Set the TX CONTROL select switch at the front panel in the position CALL
- Connect a user station to the intercom party line
- Press and hold a CALL button on that user station
- Turn trimmer R29. If the trimmer is turned too much counter clockwise the internal Transmit Switch is triggered every second (this is also shown by the Rx/Tx LED).
  f the trimmer is turned too much clockwise the internal Transmit Switch has a very long release time when the CALL button of the connected station is released. Try to find a suitable position for the trimmer in between those two points.

10.0 TECHNICAL SPECIFICATIONS

Side Tone (party line)
Rejection : 0 – 35 dB adjustable

Dimensions & Weight
Width: 90 mm / Height: 38 mm
Depth: 124 mm / Weight: 260 grams

11.0 BLOCK DIAGRAM PS 155



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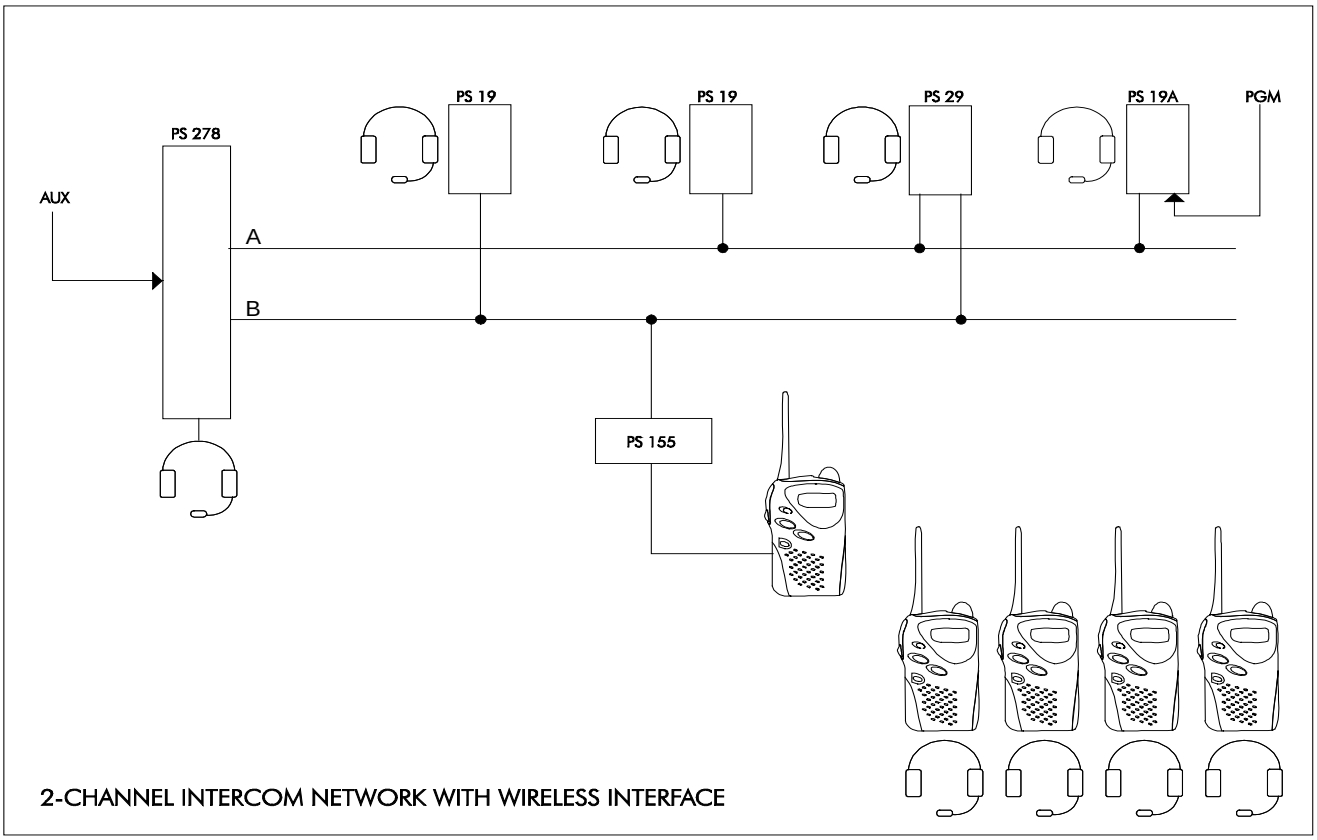
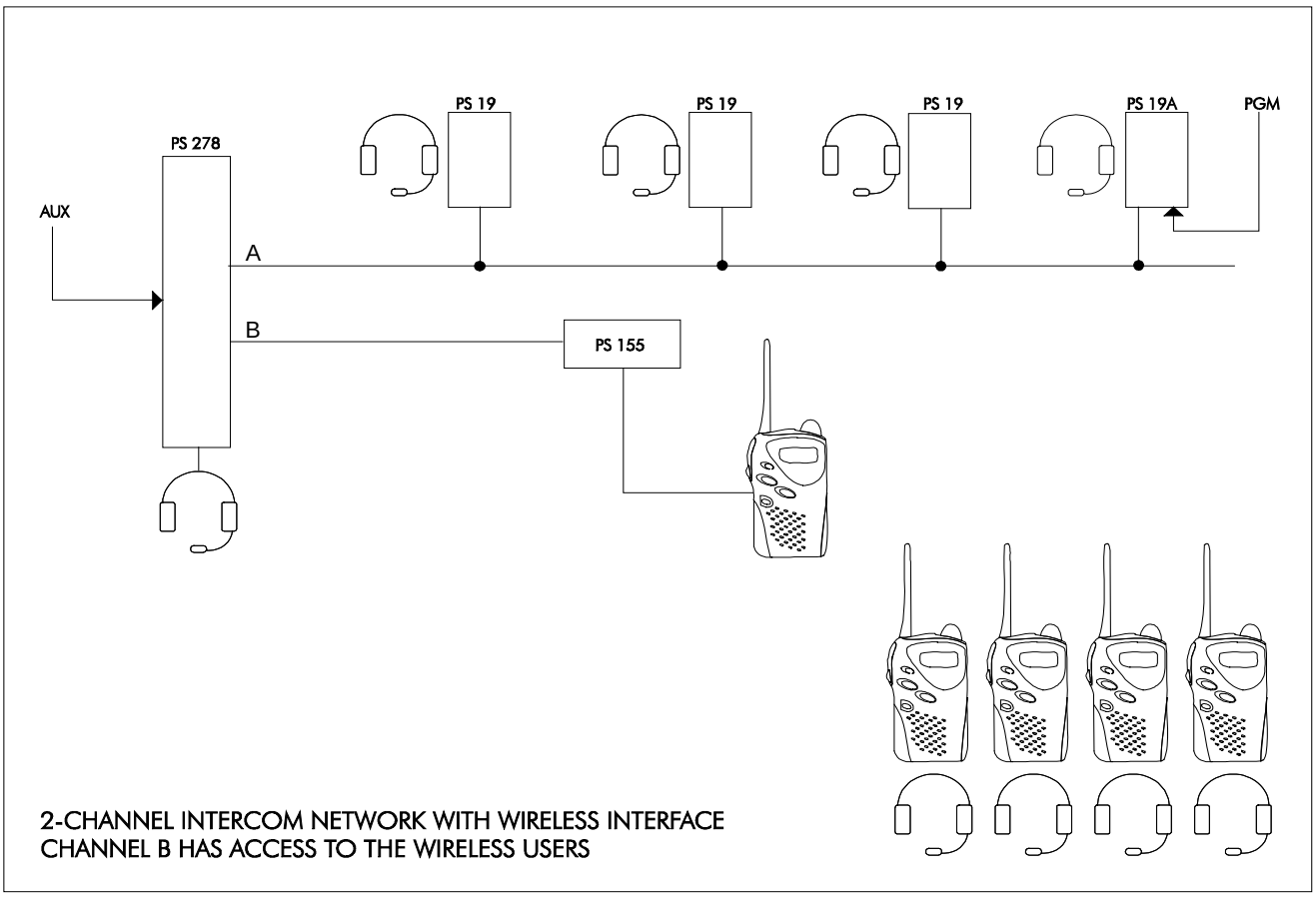
12.0 PROBLEM SOLVING

PROBLEM	CAUSE	CHECK
PS 155 does not respond	No power supply or defective cable of the wired intercom	Wired intercom power supply and party line cable
No audio of the wireless system to the party line	'Receive' volume is too low Cable not properly connected PS 155 not (properly) connected	'Receive' volume knob Cable to the wireless unit Cable to the wired intercom
No audio from the party line to the wireless system	'Send' volume too low Volume on wireless unit too low Cable to wireless unit not properly connected PS 155 not (properly) connected	'Send' volume knob Volume knob of the wireless unit Cable to the wireless unit Cable to the wired intercom
Wireless unit does not respond to the external PTT switch	TX Control not in the position PTT Connection of the external switch not properly done Connection between wireless unit and PS 155 incorrect.	Change the TX Control switch to PTT Connection of the external PTT switch The cable and the details of both units..
Units do not respond to VOX	TX Control switch not in the position VOX VOX level too low Audio level on the wired intercom line too low	Put the TX Control switch in the position VOX Turn the VOX level trimmer clockwise Increase the audio level on the wired intercom by speaking louder and closer into the microphone.
In VOX mode the units stays in transmit mode	VOX level too sensitive Bad side tone rejection Level of the wireless unit is too high	Turn the VOX trimmer counter clockwise Re-adjust the side tone trimmers again Turn the volume control of the wireless unit down.
In VOX mode the signal is briefly interrupted	VOX level not sensitive enough Release time too short	Turn the VOX LEVEL trimmer clockwise Turn the VOX RELEASE trimmer clockwise.
After reception of audio from the wireless unit the PS 155 switches to transmit briefly	Bad side tone rejection Input signal is too high Input signal is too high	Re-adjust the side tone trimmers again. Turn down the 'Receive' level Turn down the volume of the wireless unit.
The audio on the party line changes when the PS 155 changes transmit and receive mode (interference/distortion).	Send and/or Receive volume too high Improperly connected cable. Bad sidetone rejection	Turn down one or both levels Check cables and connections. Re-adjust the side tone trimmers again

13.0 POSSIBLE SYSTEM CONFIGURATIONS



2-CHANNEL INTERCOM NETWORK WITH WIRELESS INTERFACE



2-CHANNEL INTERCOM NETWORK WITH WIRELESS INTERFACE
CHANNEL B HAS ACCESS TO THE WIRELESS USERS